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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,155	03/24/2004	William P. Corbett	2003-0839.02	5269

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EXAMINER
PHAM, HAI CHI

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/808,155	CORBETT ET AL.
	Examiner	Art Unit	
	Hai C. Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>28 June 2006</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-38</u> is/are pending in the application.

    4a) Of the above claim(s) <u>30-38</u> is/are withdrawn from consideration.

5) ☒ Claim(s) <u>29</u> is/are allowed.

6) ☒ Claim(s) <u>1-7,14-24,26 and 28</u> is/are rejected.

7) ☒ Claim(s) <u>8-13,25 and 27</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>24 March 2004</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>03/24/04</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Applicant's election of Invention including claims 1-29 in the reply filed on

06/28/06 is acknowledged. Because applicant did not distinctly and specifically point

out the supposed errors in the restriction requirement, the election has been treated as

an election without traverse (MPEP § 818.03(a)).

2.   Claims 30-38 are withdrawn from further consideration pursuant to 37 CFR

1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or

linking claim.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1, 3-4, 19, 21, 23, 24, 26 are rejected under 35 U.S.C. 102(b) as being

anticipated by Pham et al. (US 5,585,836).

Pham et al., an acknowledged prior art, discloses an electrophotographic color

image recording apparatus and method with correction for bow or laser beam process

direction position errors, the method comprising reading image data from a first memory

location (data source 410), said image data comprising pixels arranged in a plurality of

columns and a plurality of rows (each line of image data comprises a plurality of pixels),

performing pixel shifts on select columns of said image data based upon a bow profile

(bow template RAM 406) that characterizes process direction position errors of Pels

written by a laser beam as it traverses generally in a scan direction, to define adjusted

image data (each scan line of pixel data is divided into groups based on the grouping A,

B, C of the LED array, and the correction repositions or shifts the dot placement based

on three consecutive lines of pixel data so as to form a straight scan line) (col. 13, line

26 to col. 14, line 50), storing said adjusted image data to a second memory location

(data selector 420 combines the three lines of pixel data to form a single line of pixel

data in accordance with the bow error or correction data based on the bow template

RAM 406), and deriving a laser signal from said adjusted image data in said second

memory location (the bow-corrected line of pixel data at 403 is used to drive the LEDs)

(Figs. 8-9).

Pham et al. further teaches:

- said second memory location (data selector 420) stores said adjusted image data

   for less than the entirety of said image (the data selector 420 stores one bow-

   corrected line of pixel data at a time),

- organizing said image data into a plurality of bands (at least three consecutive

   lines of pixel data), each band comprising a predetermined number of columns

   and a predetermined number of rows of pixels of said image data (the three lines

   of pixel data formed bands having three rows of pixel data and a number of

   columns represented by the groups A, B, C), wherein pixel shifts are performed

on select columns of each band based upon said bow profile and said plurality of

bands are processed one band at a time (col. 13, line 26 to col. 14, line 15),

- said pixel shifts are performed from the top to the bottom of said image,

- a third memory location (bow error template RAM 406), wherein said bow profile

  is stored in said third location as a plurality of instructions that describe the

  process direction shifts for corresponding Pel positions along said scan path

  required to compensate for said laser beam process direction position errors,

- said electrophotographic device comprises a color device, and said bow

  processor performs pixel shifts for each of the cyan, yellow, magenta and black

  image planes (the bow correction is made not only to correct the skew in the

  scanning line of each color but also to correct the misregistration of the colors in

  the electrophotographic color image recording apparatus),

- said bow processor is implemented in an application specific integrated circuit

  (the driving circuit for the LED print head is an integrated circuit).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Pham et al. in view of Kerby et al. (US 6,445,404).

Pham et al. discloses all the basic limitations of the claimed invention except for the second memory location is dimensioned to store at least two bands of adjusted image data, a first band of adjusted image data is processed from said second memory location for deriving said laser signal while pixel shifts are performed on said image data according to said bow profile such that a second band of adjusted image data is stored in said second memory location, and processing of said first band of adjusted image data to derive said laser signal must be complete before storing a third band of adjusted image data into said second memory location.

Kerby et al. discloses an image forming apparatus provided with a single laser diode and two dedicated line buffers for providing signals to drive the laser diode, wherein after driving the laser diode with the raster data stored in the first line buffers, the laser diode is then driven by the raster data contained in the second line buffer while the first line buffer reads in new (i.e., third) raster data, the switching between the two line buffers continues until the print image is complete (col. 7, lines 55-67).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Pham et al. with a storage containing two bow-corrected lines of pixel data and the switching configuration of the line data memory for recording the image data as taught by Kerby et al. the motivation for doing so would have been to obtain an efficient use of the memory and a high speed image recording.

7.   Claims 2, 14-18, 20, 28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Pham et al. in view of Yoshida et al. (US 5,719,680).

        Pham et al. discloses all the basic limitations of the claimed invention including

the instruction indicating which pixel in the different groups of pixels is to be shifted or

corrected, the instruction being a 2-bit word that represents image shift for each pixel,

and the shift of the pixels being performed relative to adjacent columns or groups (col.

12, lines 34-56), but except for the specific indication of whether that column should be

shifted up, down, or not shifted, the instruction being a one-bit instruction indicating the

up or down-shifting of the pixels, constraining said instructions according to rules that

limit the number of process direction shifts that can be corrected, and the instructions

being constrained to limit the maximum amplitude of pixel shifts allowable in said bow

profile, and said first and said second memory locations comprise first and second

areas of a main system memory, the bow microprocessor.

        Yoshida et al., an acknowledged prior art, discloses a color printer and a method

for correcting skew in the scanning lines controlled by the microprocessor (MPU 51a),

wherein the image data is read into the ROM (51b), which also serves as a correction

data storage for correcting the scanning line skew, the skew correction further including

a one-bit instruction specifying left-down skew or left-up skew for correction is provided

to operate the DIP switch 53, and wherein the correction data limit the shift of the pixels

up to 5 pixels in either directions depending on the amount of skew (col. 5, lines 1-6)

(Figs. 4, 9).

It would have been obvious at the time the invention was made to a person

having ordinary skill in the art to modify the device of Pham et al. to provide the bow

correction instruction configured with one-bit instruction for the indication of the up or

down-shifting of the pixels and to restrict the maximum amplitude of pixel shifts

allowable in the bow profile as taught by Yoshida et al. The motivation for doing so

would have been to provide a complete instruction for effectively shifting the pixel to the

appropriate position with a reference line.

8.   Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pham et

al. in view of Yoshida et al., as applied to claim 21 above, and further in view of Baldwin

(US 5,764,243).

Pham et al. in view of Yoshida et al. discloses all the basic limitations of the

claimed invention except for the image data is transferred to said bow processor and

said bow processor writes said adjusted image data to said second memory location

using direct memory access transactions.

Baldwin teaches a computer processing method for transferring image data into

FIFO memory using direct memory access transactions so as to automatically ensure

that there is room in the FIFO before it performs further transfers (col. 15, lines 8-37).

It would have been obvious at the time the invention was made to a person

having ordinary skill in the art to provide the bow microprocessor in the modified device

of Pham et al. with the DMA controller during the image data transfer as taught by

Baldwin. The motivation for doing so would have been to prevent overflow of the

memory to occur as suggested by Baldwin.

Allowable Subject Matter

9.   Claim 29 is allowed.

10.   Claims 8-13, 25 and 27 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: claim 29 is

patentable over the prior art of record because of the claimed method for altering the

image data for correcting bow includes the steps of "storing the adjusted image data in

a destination buffer, capturing adjusted image data shifted out of said section in an

overflow buffer, and outputting said adjusted image data to a printhead", which are not

taught by the prior art of record considered alone or in combination.

The following is a statement of reasons for the indication of allowable subject

matter: the primary reason for the indication of the allowability of claim 8 is the inclusion

therein, in combination as currently claimed, of the limitation "said second memory

location comprises a destination buffer and an overflow buffer", "wherein performing

pixel shifts comprises performing pixel shifts according to said bow profile on a select

band, storing the results in said destination buffer, and storing pixels that were shifted

out of said select band into said overflow buffer", which are not found taught by the prior

art of record considered alone or in combination.

The primary reason for the indication of the allowability of claim 25 is the inclusion therein, in combination as currently claimed, of the limitation "a queue accessible by said bow processor for temporarily storing and prioritizing sections of said image data prior to said bow processor applying said pixel shifts to said image", which is not found taught by the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claim 27 is the inclusion therein, in combination as currently claimed, of the limitation "said second memory location includes a destination buffer, an overflow buffer and an output buffer", and "wherein said system further comprising at least one control buffer in data communication with said bow processor that points to the location in said second memory of said destination, overflow and output buffers", which are not found taught by the prior art of record considered alone or in combination.

Claims 9-13 are allowable because they are dependent from claim 8 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HAI PHAM
PRIMARY EXAMINER

August 31, 2006